UNITED STATES DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION

Oversight Hearing on

2006 Prudhoe Bay Shutdown: Will Recent Regulatory Changes and BP Management Reforms Prevent Future Failures?

Before the
Committee on Energy and Commerce
Subcommittee on Oversight and Investigations
United States House of Representatives

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U.S. DEPARTMENT OF TRANSPORTATION
BEFORE THE
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I. INTRODUCTION

Chairman Dingell, Ranking Member Barton, members of the Committee: Thank you for the invitation to appear today. I am pleased to discuss the actions of the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) to oversee continued safe operations of BP Exploration Alaska, Inc. (BPXA) and to prevent future pipeline failures like the one that occurred on BPXA's operations on the North Slope in March 2006.

Since we last appeared before the Committee, Congress passed and the President signed the Pipeline Inspection, Protection and Enforcement Safety (PIPES) Act of 2006. I want to thank Chairman Dingell, Ranking Member Barton and the Committee for their leadership in advancing this important safety legislation. In compliance with the PIPES Act, PHMSA is moving forward with several rulemakings, including extending full regulatory protection to low-stress hazardous liquid pipelines, like the BPXA lines that are the subject of this hearing. These new requirements will reduce the risk of future failures of this type. We also recently launched our enforcement transparency website, to provide the public important information about

PHMSA's enforcement actions. I am pleased to report we took this action eight months in advance of the statutory deadline and we have received positive feedback from the stakeholder community on the use of this website. To further enhance the transparency of our operations we also have restored limited public access to the National Pipeline Mapping System. We took this action in close coordination with the Transportation Security Administration in order to properly balance important security and public right-to-know interests. We have a public meeting next week on improving control room management and human factors risks. We look forward to continuing to work closely with the Committee and keeping you apprised of our progress as we work to implement the PIPES Act.

We also have progress to report concerning our oversight of BPXA. Based on our ongoing monitoring of BPXA activities and pipeline inspection results, we have increasing confidence in engineering, operations and maintenance of the existing transit lines. BPXA has also begun replacement of the Prudhoe Bay transit pipelines and is beginning to address management problems that contributed to the failures they experienced last summer. We are also improving our coordination with the State of Alaska and our expectation is this improved coordination will result in better oversight of future BPXA activities in Alaska.

II. **OVERVIEW OF DOT RESPONSE TO THE BPXA FAILURES**

As you know, PHMSA immediately took action following a March 2, 2006 oil spill caused by the failure of a 34-inch diameter above ground pipeline in the Western Operating Area (WOA) referred to as OT-21. We exercised statutory

jurisdiction over BPXA's three transit lines by issuing a Corrective Action Order (CAO), and directed the remediation and repair of the failed line. Our order covered the WOA line, which failed in March, as well as the Eastern Operating Area and the Lisburne lines, a total of 22 miles of low-stress lines. Our mission remains knowing the condition of these lines, understanding past and potential failure mechanisms, and ensuring that the operator takes all needed action to keep the pipelines operating safely in the future.

Our Corrective Action Order required BPXA to determine the condition of its pipelines and to repair defects. We ordered BPXA to run what are known as cleaning or maintenance pigs to remove solids in the line and to perform in-line inspections, known as smart pigging, to understand the pipe condition from the inside out. We directed more frequent testing and an enhanced corrosion management plan, including addressing the use of corrosion inhibitors to improve corrosion prevention. We required running cleaning pigs on a routine basis to remove water and other constituents that could contribute to internal corrosion.

Since then, we dispatched multiple teams to inspect the pipe that failed; assess the cause of failure; review operations and maintenance records; review qualifications of personnel; monitor operations, including testing; inspect repairs; and verify compliance with our requirements. PHMSA personnel evaluated fully all potential integrity threats to the transit lines along with BPXA programs to mitigate those threats.

We directed improvements of BPXA's Interim Monitoring Strategy such as increased corrosion monitoring points to reduce the risk that vulnerable

locations could be overlooked. PHMSA directed BPXA to utilize extensive non-destructive testing to better evaluate the condition of the pipelines until the lines could be fully assessed with an in-line inspection tool or smart pig. We directed that more stringent repair criteria be utilized and that communications be improved between analysts and field teams. We also required frequent patrolling of the pipelines, including the use of infrared technology. We have maintained a field oversight presence to ensure the operator was taking the actions necessary to maintain safety.

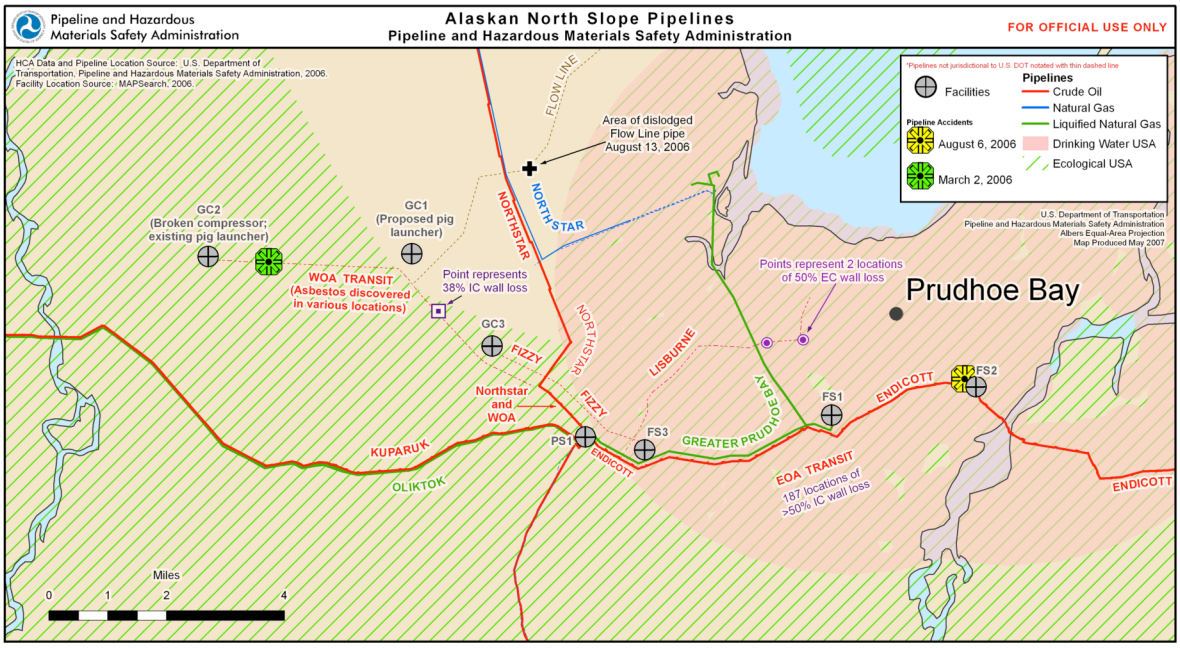
Before we allowed BPXA to proceed with pigging, we investigated the amount, composition and density of "sludge" material and how it would be handled to be sure that BPXA operations posed no risk to the safety and reliability of the Trans-Alaska Pipeline System. On July 20, 2006, we issued an amendment (Amendment Number One) to our original order, mandating that BPXA develop specific plans and timetables or parallel tactics to expedite pigging operations on lines that had not yet been cleaned. We required safe "de-oiling" of the idled OT-21 line segment that failed in March, 2006. The pipeline still contained approximately 17,000 barrels of oil. We also ordered BPXA to obtain post-pigging wall samples and gamma ray photography post pigging to gain the best possible understanding of the real-time levels of remaining solids.

On July 22, 2006, 37 days after the deadline established in our March order, BPXA performed the smart pigging ordered by PHMSA on the 30-inch segment of the FS2-FS1 Eastern Operating Area (EOA) pipeline. BPXA informed us of the results of the testing on August 4. BPXA's report identified 16 locations of wall loss in excess of 70 percent of the original

thickness in 12 separate areas. Two locations showed over 80 percent loss and 187 sites showed pipe wall loss exceeding 50 percent. While the failure on the WOA line occurred on a low spot in a caribou crossing, the locations of severe wall loss on the EOA line were on straight pipe, indicating the possibility of different types of corrosion processes occurring in different operating areas.

On August 6, 2006, BPXA discovered a leak while performing direct examination of the EOA as a follow-up to the mandated smart pig inspection. On the basis of this leak and the discovery of several other locations that were beginning to leak, BPXA reported to us its initial decision to shut down both the EOA line and the WOA line. BPXA subsequently decided to keep the WOA line operating and to consider restarting the 34-inch segment of the EOA line.

In response to this second spill on the EOA line, on August 10, 2006, PHMSA issued a second amendment to our order (Amendment Number Two), requiring, among other safety measures, additional rigorous, automated ultrasonic inspections on a continuous basis of the pipelines that had not yet been pigged and outlining the standards BPXA would need to meet to restart its EOA pipeline. The order also required the de-oiling of the failed segment of the EOA line. Given that BPXA was not able to sufficiently explain the causes of the corrosion on the Eastern line at that time, and the potential extent of damage to the pipe wall, PHMSA required that BPXA demonstrate that the EOA line was in safe condition for pigging operations. PHMSA authorized restart for testing only when we had adequate data and corrosion modeling plus analysis of data regarding the EOA line.



III. DOT HAS TAKEN ACTIONS TO REQUIRE SAFE OPERATION OF THE PRUDHOE BAY OIL TRANSIT LINES

Recognizing the impact on nationwide crude production following the shut down of this system, PHMSA maintained a monitoring presence on the North Slope through this assessment process, focused on getting a better understanding of the condition of the EOA line to determine whether it could safely return to operation for the purposes of cleaning and inspection, and eventually operation. Our review of the data collected for the EOA 34-inch diameter pipeline was extensive. We engaged expert independent consultants to provide an additional perspective on the statistical sampling approach that BPXA employed and the effectiveness of the corrosion field testing. PHMSA expertise, combined with opinions provided by these additional resources, as well as the results of BPXA independent consultants, were integrated into our

decision in September of last year to allow the 34-inch EOA pipeline to return to operation for the purposes of cleaning and inspection.

Following DOT protocol for preparing the EOA pipeline for return to service, BPXA launched a magnetic flux tool in the 34-inch diameter pipeline, which could detect the level of internal and external corrosion on the full circumference of the pipeline.

As a parallel activity, as required by our CAO, BPXA continued to conduct external tests, using ultrasonic means and other approved technologies on the WOA pipeline, to provide data to support that pipeline's continued safe operation.

With respect to the WOA pipeline which was still in operation. BPXA removed the sludge from the line and launched an in-line inspection tool, as required by PHMSA orders, to determine the extent of corrosion on the line.

The in-line inspection results for both of the oil transit lines, along with results from the other external tests, indicated that the lines are "fit" for continued use until the new pipelines that are currently under construction are operational next year. Any damage observed is not significant enough to warrant immediate concern, but aggressive corrosion control and continuous monitoring is required. Prior to making this determination, PHMSA staff physically inspected all of the higher profile corrosion sites identified by the smart tool runs.

As added protection to people and the environment, with a third Amendment of the CAO issued on April 27, 2007, PHMSA is requiring frequent corrosion

monitoring of numerous sites on the pipelines. Additionally, we are requiring that BPXA repeat in-line inspections for these pipelines on a 12-month cycle and provide data from the inspections for our review and analysis.

To complete our investigation, PHMSA and subject matter experts from the Oak Ridge National Laboratory are reviewing and analyzing the WOA and EOA pipeline designs, maintenance policies, corrosion monitoring methods, inspection procedures and operating practices.

IV. MORE INSIGHT INTO CORROSION

We've continued our examination of corrosion mechanisms affecting these lines to improve our understanding of how the leaks occurred and the risks of further line degradation.

Last September, based on our analyses at that time, we believed that internal corrosion, induced by microbial activity, caused the WOA pipe to deteriorate at the point where it failed – a low section in a caribou crossing. Additional testing conducted since the fall reinforced that assessment. Given the many risk factors in the North Slope environment, including use of water in the production process, the chemistry of the crude oil product itself, and the varied geologic factors in the production field, we believe BPXA should have run cleaning pigs on these lines on a regular basis to reduce the potential for this microbial process.

Under PHMSA's direction, independent corrosion experts reviewed the conditions of the EOA and WOA pipelines and found evidence of emulsified/entrained water in the oil – and that the water has a high chloride

concentration. This environment is conducive to microbial populations leading to localized corrosion. Additionally, sediments/sludge likely reduced the effectiveness of any corrosion inhibitors that were being used, prior to the cleaning regimen required by PHMSA.

Laboratory test results and analysis on the WOA pipe sample, from BPXA's third party consultant, became available on March 30, 2007. The pipe contents included a 5-inch thick layer of sand and silt with evidence of corrosion inhibitor bound to it. The BPXA analysis confirms our original assessment from last year that the primary corrosion mechanism involved sulfur-reducing bacteria.

Last week, we observed final testing of the EOA pipe sample and reviewing the results. We will withhold a determination on the EOA until we have reviewed the data from this testing.

V. CONSTRUCTION OF NEW PIPELINES UNDERWAY

In response to a formal request, on January 10, 2007, BPXA presented PHMSA its plans for rebuilding the EOA and WOA pipelines. The plans reflect many engineering and safety upgrades over the existing pipeline system and construction of the new pipeline is underway.

The new lines are being designed to PHMSA code requirements. BPXA is utilizing smaller pipe diameters to increase fluid velocity to a point that should prevent any water from dropping out of the oil mixture; minimize the accumulation of fine solids; and reduce the opportunity for microbial growth. The pipe elevation will also be higher, providing better access for inspection

and maintenance. The higher elevation will also eliminate intentional dips for animal- and road-crossings and will reduce the potential collection of water and solids. In addition, new and deeper pipeline supports for stability, and better coatings and insulation, will also be utilized to reduce external corrosion.

Additionally, BPXA has committed to installation of new and redundant leak detection systems which are more sensitive and more likely to detect small leaks. A dedicated chemical injection system will provide better control and greater effectiveness of corrosion inhibitors in the fluid stream. The system design will include pig launching and receiving facilities for all segments and will also be appropriate to withstand the harsh climatic conditions.

PHMSA continues to provide in the field oversight of the construction activities. Progress is constrained by weather conditions, allowing for heavy construction only during the winter months of January through April when ice roads provide for travel over tundra without damage. BPXA's schedule calls for all of the new Oil Transit System lines to be in operation by the end of December 2008. Communication from BPXA to PHMSA with respect to the project milestones is required by our third Amendment of the CAO.

VI. GOOD ENGINEERING IS ONLY PART OF THE SOLUTION

PHMSA requires a strong risk-based systems approach to ensure the safety and reliability of our nation's energy pipeline infrastructure, and our Integrity Management Program (IMP) (49 C.F.R. 195.452) approach continues to show positive results. PHMSA uses integrity management as the primary strategy

to integrate protection of infrastructure and people and manage the pipeline systems' risk through plans and safety processes that attain improved safety performance.

The IMP process is the operator's responsibility. In using this strategy, operators must communicate it through their leadership to all employees and know the approach is understood, implemented, documented and measured. Operators need to provide transparency throughout their organization in identification of risks; controls chosen; and evaluation of risk control effectiveness. As risks change over time, operators need to be vigilant to assess these risks thoroughly and systematically and measure risk control performance. Operators need to use the best available data on risk history and potential; analyze results; make the best decisions; and deploy attention and resources against the greatest risks--worst risk first.

In evaluating BPXA's posture on the North Slope, in addition to our own observations, PHMSA took a hard look at the important lessons learned from BP's Texas City Refinery accident as determined by the U.S. Chemical Safety and Hazard Investigation Board and other reports prepared for BP. These examinations, and their focus on BP's "process safety management" programs and systems, should be highly instructive to BP. In addition, reports have noted that a strong culture in personal safety does not necessarily translate to a strong culture in process safety. PHMSA agrees and because our pipeline integrity management program is based on these process safety principles, we believe expanding the application of the IMP system-wide by BPXA is a good first step.

BPXA is, in fact, doing this on the North Slope. We believe that to improve performance and continue to make progress, it is BPXA's responsibility to go beyond IMP regulatory minimums if safety demands. To advance safety culture, the set of clearly defined values must be communicated and demonstrated by top management and shared throughout the organization. Safety must be integrated into business priorities. Safety culture promotes a trusting and open environment for the discovery and resolution of safety problems and emphasizes the importance of looking forward, rather than looking solely through a "rear view mirror" which focuses only on incident data.

We are currently working with BPXA in reviewing leading indicators to get better insights into their operations. We will address how BPXA can make more effective the practice of comprehensive risk assessment and risk management – we believe this is critical to their improved safety, environmental and reliability performance.

BPXA is significantly modifying its approach to managing risks on the Prudhoe Bay systems, and has included all jurisdictional pipelines in its integrity management program, whether or not the lines are actually in or near a high consequence area. We are pleased to see this higher level of commitment from BPXA and will be monitoring its implementation carefully.

I also want to highlight the commitment of the Department and the State to coordinate our efforts to provide more effective oversight of BPXA and other pipeline operations in Alaska. PHMSA jurisdiction over the transportation of oil and gas products covers only a part of a vast system of oil and gas

operations. For the most effective oversight, we believe insights on improved safety, environment, and reliability of performance will be derived from a holistic systems perspective. We have offered to share our data and approaches with the State as part of broader efforts in this area. We foresee good opportunity for progress through improved coordination of our programs.

Thank you. I would be pleased to answer any questions you may have.

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